

WETLAND MITIGATION SITE MONITORING REPORT - 2003

FA 662 (IL 4) Sangamon County

Introduction

This report details monitoring of the wetland mitigation site created to compensate for FA 662 (IL 4) in Sangamon County. The site consists of approximately 2.8 ha (6.8 ac) of wetland creation. The wetland creation site is located north of Springfield, IL, at the southwest corner of the intersection of IL 4 and Spring Creek. The legal location is NW/4, SW/4, Section 15, T. 16 N., R. 5 W. The Illinois Department of Transportation (IDOT) completed construction of the site in 1996/7. Sapling trees and small shrubs were planted during the autumn of 1997 and the spring of 1998, respectively (T. Brooks, IDOT Wetlands Unit, memo to Allen Plocher, 30 March 1999). Additional shrubs and sapling trees were planted in the spring of 2000 to compensate for the excessive mortality observed in 1999. On-site monitoring was conducted on September 17, 2003.

This report discusses the goals, objectives, performance criteria for the mitigation project, methods used for monitoring the site, monitoring results, and discussion and recommendations based on the results. Methods and results are discussed by performance criteria for each goal.

Goals, Objectives, and Performance Standards

Goals, objectives, and performance standards follow those specified in the monitoring plan (T. Brooks, IDOT Wetlands Unit, 1999) and the wetland compensation plan (IDOT, 1995) developed for this site. Performance criteria are based on those specified in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and in *Guidelines for Developing Mitigation Proposals* (USACE 1993). Each goal should be attained by the end of the 5 year monitoring period. Goals, objectives, and performance criteria are listed below.

Project goal 1: The created wetland community should be a jurisdictional wetland as defined by current federal standards.

Objective: The created wetland should compensate for the loss of 2.8 ha (6.8 ac) of scrub-shrub wetland at a 1:1 ratio.

Performance criteria:

- a. Predominance of hydrophytic vegetation: More than 50% of the dominant plant species must be hydrophytic.
- b. Presence of wetland hydrology: The area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season.
- c. Occurrence of hydric soils: Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at the site.

Project goal 2: The created wetland plant community should meet standards for floristic composition and vegetation cover.

Objectives: Planting native shrubs and tree sapling species will create a scrub-shrub wetland. Herbaceous vegetation will be allowed to colonize the site naturally.

Performance criteria:

- a. Establishment of planted shrubs and trees: Planted shrubs and tree seedlings should have a survival rate of 80% each year for five years.
- b. Floristic Quality Assessment: At least 50% of the plant species present should be non-weedy, native, perennial species.
- c. Dominance of vegetation: None of the three most dominant plant species in either site may be non-native or weedy species.

Methods

Project goal 1

a. Predominance of hydrophytic vegetation

The method for determining dominant vegetation at a wetland site is described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989). It is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is then assigned its wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter, *i.e.*, FAC, FAC+, FACW, and OBL, is considered a hydrophyte. A predominance of vegetation in the wetland plant community exists if more than 50% of the dominant species present are hydrophytic. Since the survival of planted hydrophytic trees and shrubs on non-wetlands (*i.e.* yards) is well documented, these species were excluded from calculations of percentage of dominant hydrophytic species.

b. Presence of wetland hydrology

Illinois State Geological Survey (ISGS) personnel installed three ground water monitoring wells and one surface water monitoring device at the site in 1999. Locations for these sites can be found in the ISGS report *Veteran's Parkway, Springfield Wetland Compensation Site* (Miner 1999). Water-level data was collected beginning in July, 1999. Methods are further described in the ISGS document *Annual Report for Active IDOT Wetland Compensation and Hydrologic Monitoring Sites* (Fucciolo et al. 2003).

c. Occurrence of hydric soils

The soil was sampled in order to monitor hydric soil development. Soil profile morphology including horizon color, texture, and structure was described at various points throughout the site. Additionally, the presence, type, size, and abundance of redoximorphic features were noted.

Hydric soils probably develop slowly, and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at the end of the five-year monitoring period, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation persist at the site.

Project goal 2

a. Establishment of planted shrubs and tree saplings

In order to create and restore floodplain forest, small shrubs and tree saplings were planted at the compensation site. According to the tasking order for this project (T. Brooks, IDOT Wetlands Unit, memo to Allen Plocher, March 30, 1999), the following number of shrubs and trees were planted at the site:

Table 1. Shrub species planted in the created wetland (Spring 1998).

Species	Common Name	Number
<i>Cephalanthus occidentalis</i>	Buttonbush	570
<i>Cornus stolonifera</i>	Red osier dogwood	570
<i>Ilex decidua</i>	Swamp holly	570
<i>Lindera benzoin</i>	Spicebush	570
<i>Viburnum lentago</i>	Nannyberry	570
TOTAL		2850

Table 2. Tree species planted in the created wetland (Autumn 1997).

Species	Common Name	Number
<i>Betula nigra</i>	River birch	205
<i>Carya laciniosa</i>	Kingnut hickory	205
<i>Fraxinus pennsylvanica</i>	Green ash	205
<i>Quercus bicolor</i>	Swamp white oak	205
<i>Quercus palustris</i>	Pin oak	205
TOTAL		1025

Due to the high mortality observed in 1999, the following additional trees and shrubs were planted (L.J. Haasis, memo to W.E. Martens, 2000):

Table 3. Additional shrub and tree plantings in the created wetland (Spring 2000).

Species	Common Name	Number
<i>Cornus stolonifera</i>	Red osier dogwood	750
<i>Quercus bicolor</i>	Swamp white oak	200
<i>Quercus macrocarpa</i>	Bur oak	100
<i>Quercus pagoda</i>	Cherrybark oak	250
<i>Quercus palustris</i>	Pin oak	250
<i>Quercus rubra</i>	Red oak	150
TOTAL		1700

Survivorship and density of planted trees and shrubs was determined through a census of the created wetland. All live trees and shrubs were counted. Tree and shrub survival was calculated as a percentage of the number of stems reported to have been planted: (Total number of live planted stems counted/total number of planted stems reported) x 100.

b. Floristic Quality Assessment

The Floristic Quality Assessment (Taft et al. 1997) was applied to the plant communities at the site to evaluate floristic quality and nativity. The assessment methodology is used to identify natural areas and facilitate floristic comparisons among sites. This technique is part of the

procedure for the long-term monitoring of natural areas and the monitoring of restored or created wetlands (Swink and Wilhelm 1994). The basis of the method is that each native plant species is assigned a coefficient of conservatism (C) ranging from 0 to 10. Individual coefficients of conservatism are ranks of species behavior and reflect the committee's (Taft et al. 1997) confidence level for a taxon's correspondence to anthropogenic disturbances. Coefficient values range from 0 to 10, with plant species assigned 0 having low affinities for natural areas and those assigned 10 having very high affinities. When a complete species list is assembled for a site, the overall average conservatism coefficient (\bar{c}) and a site floristic quality index (FQI) can be calculated. These values provide a measure of site floristic quality. Floristic quality index (FQI) values less than 5 indicate that the area is extremely weedy or in an early successional stage (Swink and Wilhelm 1994). FQI values between 20 and 35 ($\bar{c} = 3.0$) indicate that the area has evidence of native character and can be considered an environmental asset. FQI values between 35 and 50 ($\bar{c} = 3.5$) indicate that the area has significant native character.

c. Dominance of vegetation

Plant species dominance was determined as in project goal 1, a. Predominance of hydrophytic vegetation. The method for determining dominant vegetation at a wetland site is described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (1989).

In addition, photographs were taken from the three permanent photography stations established in 1999 to document changes in plant community size and composition. The locations of the photo stations are indicated on the enclosed aerial photograph. Arrows indicate the direction in which the photos were taken.

Results

Project goal 1

a. Predominance of hydrophytic vegetation

Dominant plant species for the mitigation site in 2003 are shown in Table 4 and Table 5. There were two distinctly different groups of vegetation at this site that we divided into areas 1 and 2 (see aerial photo from 1999 report). The boundary between areas 1 and 2 has fluctuated somewhat every year, but area 1 remains approximately 1.0 ha (2.6 ac) (same as in 2002). This area is essentially the same as the area mapped as possessing wetland hydrology by the ISGS in 2002. All of the dominant species for area 1 are rated OBL, FACW, FACW-, or FAC+ and are hydrophytic. Based on naturally occurring dominant species, area 2 this year also possessed dominant hydrophytic vegetation (60%).

Table 4. Dominant plant species by stratum and wetland indicator status for area 1.

Dominant Plant Species	Stratum	Indicator Status
<i>Aster simplex</i>	herb	FACW
<i>Eupatorium serotinum</i>	herb	FAC+
<i>Populus deltoides</i>	shrub	FAC+
<i>Salix exigua</i>	shrub	OBL
<i>Salix nigra</i>	shrub	OBL

Table 5. Dominant plant species by stratum and wetland indicator status for area 2.

Dominant Plant Species	Stratum	Indicator Status
<i>Betula nigra</i>	shrub	FACW*
<i>Fraxinus pennsylvanica</i>	shrub	FACW*
<i>Quercus bicolor</i>	shrub	FACW+*
<i>Quercus palustris</i>	shrub	FACW*
<i>Aster simplex</i>	herb	FACW
<i>Eupatorium serotinum</i>	herb	FAC+
<i>Panicum virgatum</i>	herb	FAC+
<i>Poa pratensis</i>	herb	FAC-
<i>Solidago canadensis</i>	herb	FACU

* Planted species.

b. Presence of wetland hydrology

The ISGS estimates that “the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2003 is 5.1 ac (2.1 ha)” (Fig. 1, next page)(Fucciolo, et al 2003). More information is available in the *Veteran’s Parkway, Springfield Wetland Compensation Site* report (Fucciolo, et al 2003).

Based on field evidence observed during an on-site visit, area 1 exhibits wetland drainage patterns, water stained leaves, algal mats, oxidized root channels, and soil saturation near the surface, and therefore possesses wetland hydrology. No field evidence of wetland hydrology was observed at area 2, which is topographically higher than area 1.

c. Occurrence of hydric soils

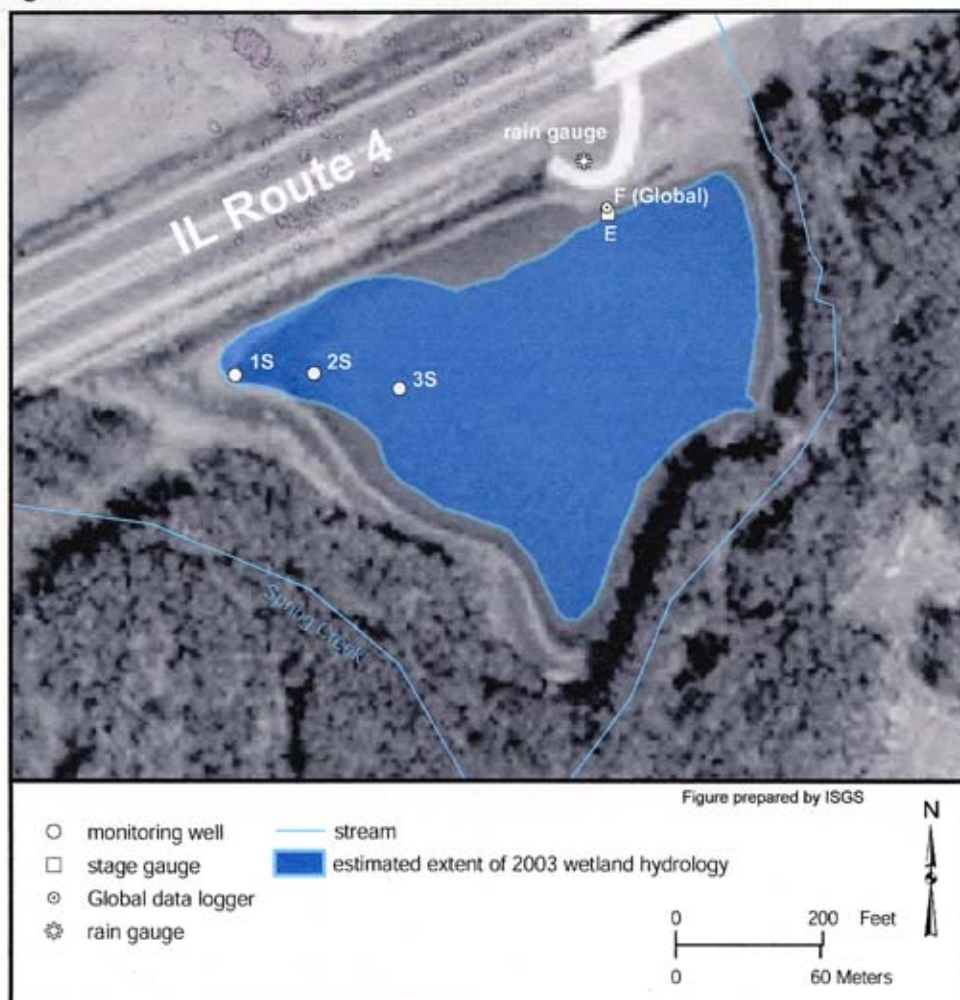
Soils examined at the site were found to be highly disturbed. Much excavation has occurred and the sites lack an undisturbed A horizon. The existing soil at much of the site is the previous subsoil layer. Topsoil was not replaced after excavation as was recommended in the wetland compensation plan (C. Perino, IDOT Wetlands Unit, 1995) developed for this site. Although the soils are disturbed, hydric soil indicators are present in area 1. Table 6 is a soil description of a typical pedon located within area 1:

Table 6. Description of the soils at the created wetland (Area 1).

Depth	Matrix Color	Concentrations	Depletions	Texture	Structure
0-4 in	2.5Y 5/2	None	2.5Y 6/1	Silt loam	Granular
4-13+ in	2.5Y 6/1 and 2.5Y 7/1	10YR 5/8 and 2.5Y 5/6	None	Silt loam	Subangular blocky grading to massive

The soils in area 2 did not possess any hydric soil indicators. In addition to being disturbed, soils at the restoration site are also compacted. It appears at this time that area 1 and a small portion of area 2 will continue hydric soil development, while most of area 2 will not.

Figure 1.



Therefore, area 1 satisfies the three criteria of wetlands, while nearly all of area 2 does not. Area 1 excludes that portion of the pond that, while shallower than the required 2 m (6.6 ft) depth, does not support hydrophytic vegetation [estimated at 1.4 ha (3.4 ac)]. Current wetland acreage at this site is therefore estimated at 1.0 ha (2.6 ac). This falls short of the project goal of 2.8 ha (6.8 ac).

Project goal 2

a. Establishment of shrubs and tree saplings

Tables 7 and 8 show the results of the census. The shrubs counted were approximately 14% of what was reported to have been planted at this site. It appeared that the shrubs were planted at an elevation that was too low, causing them to be washed away when the site flooded in the spring. The surviving shrubs show promising and vigorous growth, including some basal regrowth of shrubs. Approximately 47.6% of the trees reported as planted at the site were accounted for. There were some different species planted than what were reported, however. *Carya laciniola* was reported to have been planted but was not found at this site, while *Carya illinoensis* and *Platanus occidentalis* were found but not reported as planted. Most of the additional oak species

reported to have been planted in spring of 2000 were not found, although we did discover some of the *Quercus macrocarpa* seedlings.

Tables 9 and 10 show the percent survival for shrubs and trees respectively. These figures were calculated both by species and overall for all species of each in the entire site. The only two species that meet the criteria of 80% survivorship are *Betula nigra* and *Fraxinus pennsylvanica*; therefore, this site does not meet the performance criteria.

Table 7. Number of shrubs (by species) counted at the created wetland.

Species	Common Name	Number live	Number dead
<i>Cephalanthus occidentalis</i>	Buttonbush	444	0
<i>Cornus stolonifera</i>	Red osier dogwood	62	0
<i>Ilex decidua</i>	Swamp holly	0	0
<i>Lindera benzoin</i>	Spicebush	0	0
<i>Viburnum lentago</i>	Nannyberry	0	0
TOTAL		506	0

Table 8. Number of trees (by species) counted at the created wetland.

Species	Common Name	Number live	Number dead
<i>Betula nigra</i>	River birch	181	0
<i>Carya laciniosa</i>	Kingnut hickory	-	-
<i>Carya illinoensis</i>	Pecan	126	0
<i>Fraxinus pennsylvanica</i>	Green ash	216	0
<i>Platanus occidentalis</i>	Sycamore	53	0
<i>Quercus bicolor</i>	Swamp white oak	187	0
<i>Quercus macrocarpa</i>	Bur oak	9	0
<i>Quercus palustris</i>	Pin oak	169	0
TOTAL		941	

Table 9. Percent shrub survival (by species).

Species	Common Name	% of reported
<i>Cephalanthus occidentalis</i>	Buttonbush	77.9
<i>Cornus stolonifera</i>	Red osier dogwood	4.7
<i>Ilex decidua</i>	Swamp holly	0.0
<i>Lindera benzoin</i>	Spicebush	0.0
<i>Viburnum lentago</i>	Nannyberry	0.0
OVERALL		14.0

Table 10. Percent tree survival (by species).

Species	Common Name	% of reported
<i>Betula nigra</i>	River birch	88.3
<i>Carya laciniola</i>	Kingnut hickory	*
<i>Carya illinoensis</i>	Pecan	61.5*
<i>Fraxinus pennsylvanica</i>	Green ash	105.4
<i>Platanus occidentalis</i>	Sycamore	-
<i>Quercus bicolor</i>	Swamp white oak	46.2
<i>Quercus macrocarpa</i>	Bur oak	9.0
<i>Quercus pagoda</i>	Cherrybark oak	0.0
<i>Quercus palustris</i>	Pin oak	37.1
<i>Quercus rubra</i>	Red oak	0.0
OVERALL		47.6

* - *Carya illinoensis* probably planted instead of *Carya laciniola*

b. Floristic Quality Assessment

Two FQI values were calculated for each area from the species lists included in Appendix A. The first FQI value is calculated from only species that became established on the site naturally; the second FQI value includes the planted trees. Area 1 has an FQI value of 13.1 and a \bar{C} of 2.0 when only natural vegetation is included. When the planted species are added, the FQI value is raised to 16.9 with a \bar{C} value of 2.4. The FQI value for area 2 is 16.9 with a \bar{C} value of 2.2 when only naturally established vegetation is considered, and 20.8 and 2.5 when the planted species are included. Therefore, both areas are of fair natural quality, with area 2 on the border of being considered an environmental asset when all species are included.

Area 1 has only 39% and Area 2 has 48% non-weedy, native perennial species; therefore, neither area meets the performance criteria of 50% (Taft et al. 1997, Iverson et al. 1999).

c. Dominance of vegetation

Neither area meets the performance criteria for dominance of vegetation. At least one of the three most dominant species at either area is a non-native or weedy species. All of the dominant species at area 1 (Table 4) are native, while only 80% are native at area 2 (Table 5), the non-native species being *Poa pratensis*. At area 1, *Eupatorium serotinum* and *Salix exigua* are weedy, while *Aster simplex*, *Populus deltoides*, and *Salix nigra* are not. At area 2, *Eupatorium serotinum*, *Poa pratensis*, and *Solidago canadensis* are weedy, while *Aster simplex* and *Panicum virgatum* are not. In addition, *Solidago canadensis* is not hydrophytic.

Photographs were taken from the permanent photography stations and are in Appendix B of this report.

Discussion

After five monitoring seasons, these sites show progress towards scrub/shrub wetland establishment. As the vegetative succession proceeds, area 1 will most likely become a scrub/shrub wetland, but most of area 2 will likely not. The majority of area 1 consists of the center of the pond, which is not supporting hydrophytic vegetation; therefore, it does not meet the criteria of a wetland.

The vegetation at both areas is hydrophytic and meets the dominance criterion for native species, but weedy dominants are present in both areas. Both areas support close to 50% non-weedy vegetation (39% and 48%) after five years. Both planted tree seedlings and planted shrubs are becoming well established on the sites; however, survival (47.6% trees, 14% shrubs) is well below the 80% performance criteria. A large number of species at each site have very low coefficients of conservatism (C). This is common on disturbed and early successional sites and is not a cause for concern at this time. It is likely that as succession progresses, more conservative species will become established on the site; this can be seen in the nearly steady increase of FQI values over the monitoring period (Table 11).

Table 11.

Year	Area 1				Area 2			
	Without planted species		With planted species		Without planted species		With planted species	
	FQI	\bar{c}	FQI	\bar{c}	FQI	\bar{c}	FQI	\bar{c}
1999	8.5	1.8	11.9	2.3	7.3	1.2	11.2	1.8
2000	9.6	1.9	12.1	2.2	7.9	1.4	14.1	2.2
2001	9.7	1.7	14.5	2.3	12.2	1.8	16.3	2.2
2002	11.7	2.1	15.9	2.5	16.8	2.2	20.7	2.5
2003	13.1	2.0	16.9	2.4	16.9	2.2	20.0	2.4

The recurring primary concern for this site is finding evidence of wetland hydrology within area 2. Area 1 already has hydric soil characteristics and demonstrated wetland hydrology this year, but area 2 has not. It is doubtful whether area 2 will ever develop either wetland hydrology or hydric soils due to the slope at which it was built. An estimate of current wetland acreage at the site (area 1) is 1.0 ha (2.6 ac). This estimated area is approximately the area between the red and white lines on the previously submitted (1999) aerial photograph, which excludes the area of the pond that does not support vegetation. In addition, planted tree and shrub survivorship is very low, and weedy species continue to dominate the understory after five years.

Sometime after our September 17, 2003 field survey, 100 additional trees were reported to have been planted by IDOT just outside of this site along IL 4.

This is the fifth and should be the final year of monitoring for this site.

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Appendix A
Wetland Determination Forms

ROUTINE ONSITE WETLAND DETERMINATION

Area 1 (page 1 of 5)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Scrub/shrub wetland
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This wetland begins approximately 70 m (230 ft) south of where IL 4 crosses Spring Creek.

Do normal environmental conditions exist at this area? Yes: ☒ No: ☐
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: ☐ No: ☒

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. <i>Populus deltoides</i>	shrub	FAC+
2. <i>Salix exigua</i> *	shrub	OBL
3. <i>Salix nigra</i>	shrub	OBL
4. <i>Aster simplex</i>	herb	FACW
5. <i>Eupatorium serotinum</i> *	herb	FAC+

* Weedy species

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation? Yes: ☒ No: ☐

Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Undetermined

On Sangamon County hydric soils list? Yes: ☐ No: ☒

Is the soil a histosol? Yes: ☐ No: ☒

Histic epipedon present? Yes: ☐ No: ☒

Redox Concentrations? Yes: ☒ No: ☐ Color: 10YR 5/8, 2.5Y 5/6

Redox Depletions? Yes: ☒ No: ☐ Color: 2.5Y 6/1

Matrix color: 2.5Y 5/3 over 2.5Y 6/1 and 7/1

Other indicators: None.

Hydric soils? Yes: ☒ No: ☐

Rationale: This soil possesses a low chroma matrix, redox concentrations, and redox depletions, all of which indicate saturated or reduced conditions. Therefore, the soil at this area meets the hydric soil criterion.

ROUTINE ONSITE WETLAND DETERMINATION

Area 1 (page 2 of 5)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Scrub/shrub wetland
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This wetland begins approximately 70 m (230 ft) south of where IL 4 crosses Spring Creek.

HYDROLOGY

Inundated: Yes: X (central portion only) No: X Depth of standing water: <2.0 m (6.6 ft)

Depth to saturated soil: From 0-0.30 m (12 in)

Overview of hydrological flow through the system: This area is hydrologically influenced by overflow and culvert flow from Spring Creek and by precipitation. Water leaves the area via evapotranspiration and culvert flow into Spring Creek.

Size of Watershed: 277 km² (107 mi²) near the intersection of IL 4 with IL 125 and IL 97

Other field evidence observed: ISGS data (Fucciolo, et al., 2003) indicates all of this area had wetland hydrology this year. We observed water-stained leaves, algal surface, oxidized root channels, and wetland drainage patterns.

Wetland hydrology: Yes: X No:

Rationale: ISGS data and field evidence cited above indicates that this area is inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the area a wetland? Yes: X No:

Rationale: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present at this area; therefore, we determined that this area is a wetland. This excludes the central portion of this site which does not support vegetation.

ROUTINE ONSITE WETLAND DETERMINATION

Area 1 (page 3 of 5)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Scrub/shrub wetland
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This wetland begins approximately 70 m (230 ft) south of where IL 4 crosses Spring Creek.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
++ <i>Acer saccharinum</i>	silver maple	shrub, herb	FACW	1
+ <i>Amaranthus tuberculatus</i>	tall waterhemp	herb	OBL	1
+ <i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
+ <i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5
<i>Andropogon gerardii</i>	big bluestem	herb	FAC-	5
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Aster simplex</i>	panicled aster	herb	FACW	3
++ <i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
+ <i>Bidens tripartita</i>	beggar's ticks	herb	OBL	2
<i>Boehmeria cylindrica</i>	false nettle	herb	OBL	3
+ <i>Calystegia sepium</i>	American bindweed	herb	FAC	1
<i>Campsis radicans</i>	trumpet creeper	shrub	FAC	2
<i>Carex</i> sp.	sedge	herb	----	--
+ <i>Cyperus acuminatus</i>	taperleaf flat sedge	herb	OBL	2
+ <i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
+ <i>Cyperus iria</i>	sedge	herb	FACW	*
+ <i>Cyperus strigosus</i>	straw-colored flatsedge	herb	FACW	0
+ <i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
+ <i>Eclipta prostrata</i>	yerba de tajo	herb	FACW	2
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
+ <i>Eragrostis hypnoides</i>	creeping love grass	herb	OBL	5
+ <i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Fraxinus pennsylvanica</i>	green ash	herb	FACW	2
+ <i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
+ <i>Lindernia dubia</i>	false pimpernel	herb	OBL	5
<i>Lycopus americanus</i>	common water horehound	herb	OBL	3
<i>Lycopus virginicus</i>	bugle weed	herb	OBL	5
+ <i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
+ <i>Morus alba</i>	white mulberry	herb	FAC	*
+ <i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Penthorum sedoides</i>	ditch stonecrop	herb	OBL	2
+ <i>Phragmites australis</i>	common red reed	herb	FACW+	1

Species list continued on next page.

ROUTINE ONSITE WETLAND DETERMINATION

Area 1 (page 4 of 5)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Scrub/shrub wetland
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This wetland begins approximately 70 m (230 ft) south of where IL 4 crosses Spring Creek.

SPECIES LIST (Cont.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
+ <i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
+ <i>Polygonum hydropiper</i>	common smartweed	herb	OBL	*
+ <i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0
+ <i>Polygonum pennsylvanicum</i>	giant smartweed	herb	FACW+	1
+ <i>Polygonum persicaria</i>	spotted lady's thumb	herb	FACW	*
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
+ <i>Portulaca oleracea</i>	purslane	herb	FAC-	*
+ <i>Rorippa</i> sp.	yellow cress	herb	----	--
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2
<i>Salix amygdaloides</i>	peach-leaved willow	shrub	FACW	4
+ <i>Salix exigua</i>	sandbar willow	shrub, herb	OBL	1
<i>Salix nigra</i>	black willow	shrub, herb	OBL	3
+ <i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
+ <i>Setaria glauca</i>	pigeon grass	herb	FAC	*
+ <i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Ulmus</i> sp.	elm	herb	----	--
+ <i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

*non-native species $FQI = \sum C/N = 84/\sqrt{41} = 13.1$ $\bar{C} = \sum C/N = 84/41 = 2.0$

+weedy, annual, or non-native species ++early successional but typical of native wetlands

Planted Species

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Betula nigra</i>	river birch	shrub	FACW	4
<i>Carya illinoensis</i>	pecan	shrub	FACW	6
<i>Cephalanthus occidentalis</i>	buttonbush	shrub, herb	OBL	4
<i>Cornus stolonifera</i>	red osier dogwood	shrub, herb	FACW	4
<i>Fraxinus pennsylvanica</i>	green ash	shrub	FACW	2
<i>Platanus occidentalis</i>	sycamore	shrub	FACW	3
<i>Quercus bicolor</i>	swamp white oak	shrub	FACW+	7
<i>Quercus palustris</i>	pin oak	shrub	FACW	4

* $FQI = \sum C/N = 118/\sqrt{49} = 16.9$ * $\bar{C} = \sum C/N = 118/49 = 2.4$

*These calculations include the complete species list above, as well as the planted species.

ROUTINE ONSITE WETLAND DETERMINATION

Area 1 (page 5 of 5)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Scrub/shrub wetland
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This wetland begins approximately 70 m (230 ft) south of where IL 4 crosses Spring Creek.

Determined by: Brian Wilm, Jeff Matthews, and Rick Larimore (vegetation and hydrology)
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607 East Peabody Drive
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Illinois State Geological Survey
615 East Peabody Drive
Champaign, Illinois 61820

ROUTINE ONSITE WETLAND DETERMINATION

Area 2 (page 1 of 6)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003

Project Name: FA 662 (IL 4)

Section No.: 1-ILS

State: Illinois

County: Sangamon

Applicant: IDOT District 6

Area Name: Berm

Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.

Location: This berm begins approximately 40 m (131 ft) south of where IL 4 crosses Spring Creek.

Do normal environmental conditions exist at this area?

Yes: X No:

Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. <i>Betula nigra</i>	shrub	FACW*
2. <i>Fraxinus pennsylvanica</i>	shrub	FACW*
3. <i>Quercus bicolor</i>	shrub	FACW+*
4. <i>Quercus palustris</i>	shrub	FACW*
5. <i>Aster simplex</i>	herb	FACW
6. <i>Eupatorium serotinum</i> **	herb	FAC+
7. <i>Panicum virgatum</i>	herb	FAC+
8. <i>Poa pratensis</i> **	herb	FAC-
9. <i>Solidago canadensis</i> **	herb	FACU

* Planted species ** Weedy species

Percentage of non-planted dominant species that are OBL, FACW, FAC+, or FAC: 60%

Hydrophytic vegetation? Yes: X No:

Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Undetermined

On Sangamon County hydric soils list? Yes: No: X

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 10YR 5/6

Redox Depletions? Yes: No: X Color: 2.5Y 5/2 and 6/2

Matrix color: 2.5Y 5/4

Other indicators: This area is a constructed berm with compacted soils.

ROUTINE ONSITE WETLAND DETERMINATION

Area 2 (page 2 of 6)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Berm
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This berm begins approximately 40 m (131 ft) south of where IL 4 crosses Spring Creek.

Hydric soils? Yes: No: X

Rationale: This soil possesses a high chroma matrix and very few redoximorphic features, which indicates saturated or reduced conditions for only short duration during the growing season. Therefore, the soil at this area does not meet the hydric soil criterion. Due to extreme disturbance, the colors of this soil material may not reflect *in situ* soil genesis.

HYDROLOGY

Inundated: Yes: No: X **Depth of standing water:** N/A

Depth to saturated soil: >0.66 m (26 in)

Overview of hydrological flow through the system: This area is hydrologically influenced by overflow from Spring Creek and by precipitation. Water leaves the area via evapotranspiration and runoff into area 1.

Size of Watershed: 277 km² (107 mi²) near the intersection of IL 4 with IL 125 and IL 97

Other field evidence observed: ISGS data (Fucciolo, et al., 2003) indicates this area did not have wetland hydrology this year.

Wetland hydrology: Yes: No: X

Rationale: No indicators of wetland hydrology were observed. The relatively high landscape position and slope of this area make it unlikely that this area will be inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the area a wetland? Yes: No: X

Rationale: While marginal dominant hydrophytic vegetation is present, hydric soils and wetland hydrology are both lacking at this time; therefore, we determined that this area is currently not a wetland.

ROUTINE ONSITE WETLAND DETERMINATION

Area 2 (page 3 of 6)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Berm
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This berm begins approximately 40 m (131 ft) south of where IL 4 crosses Spring Creek.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
+ <i>Acalypha rhomboidea</i>	three-seeded mercury	herb	FACU	0
++ <i>Acer saccharinum</i>	silver maple	tree	FACW	1
+ <i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
+ <i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Andropogon gerardii</i>	big bluestem	herb	FAC-	5
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
+ <i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicked aster	herb	FACW	3
++ <i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
+ <i>Bidens tripartita</i>	beggar's ticks	herb	OBL	2
<i>Boehmeria cylindrica</i>	false nettle	herb	OBL	3
+ <i>Bromus inermis</i>	awnless brome grass	herb	UPL	*
+ <i>Calystegia sepium</i>	American bindweed	herb	FAC	1
<i>Campsis radicans</i>	trumpet creeper	shrub	FAC	2
<i>Carex grayi</i>	bur sedge	herb	FACW+	6
<i>Carex molesta</i>	sedge	herb	FAC	2
<i>Carex sp.</i>	sedge	herb	----	--
<i>Carex tribuloides</i>	sedge	herb	FACW+	3
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
+ <i>Catalpa bignoniodes</i>	common catalpa	shrub, herb	FACU	*
<i>Cephalanthus occidentalis</i>	buttonbush	herb	OBL	4
+ <i>Chamaesyce maculata</i>	nodding spurge	herb	FACU-	0
+ <i>Chamaesyce supina</i>	milk spurge	herb	UPL	0
+ <i>Cirsium arvense</i>	Canada thistle	herb	FACU	*
+ <i>Cirsium vulgare</i>	bull thistle	herb	FACU-	*
+ <i>Conyza canadensis</i>	horseweed	herb	FAC-	0
+ <i>Cryptotaenia canadensis</i>	honestwort	herb	FAC	1
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Eupatorium coelestinum</i>	blue boneset	herb	FAC+	3
+ <i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
+ <i>Festuca arundinacea</i>	tall fescue	herb	FACU+	*
<i>Fraxinus pennsylvanica</i>	green ash	shrub, herb	FACW	2
<i>Gleditsia triacanthos</i>	honey locust	herb	FAC	2
+ <i>Iva annua</i>	marsh elder	herb	FAC	0
+ <i>Juniperus virginiana</i>	eastern red cedar	tree	FACU	1

Species list continued on next page.

ROUTINE ONSITE WETLAND DETERMINATION

Area 2 (page 4 of 6)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Berm
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This berm begins approximately 40 m (131 ft) south of where IL 4 crosses Spring Creek.

SPECIES LIST (Cont.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Laportea canadensis</i>	wood nettle	herb	FACW	2
+ <i>Lespedeza cuneata</i>	sericea lespedeza	herb	NI	*
<i>Lycopus americanus</i>	common water horehound	herb	OBL	3
<i>Lycopus virginicus</i>	bugle weed	herb	OBL	5
+ <i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
<i>Mentha arvensis villosa</i>	field mint	herb	FACW	4
+ <i>Morus alba</i>	white mulberry	tree	FAC	*
+ <i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
+ <i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
+ <i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
+ <i>Physalis subglabrata</i>	smooth ground cherry	herb	UPL	0
+ <i>Pilea pumila</i>	Canada clearweed	herb	FACW	3
<i>Platanus occidentalis</i>	sycamore	herb	FACW	3
+ <i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
+ <i>Polygonum aviculare</i>	knotweed	herb	FAC-	*
+ <i>Polygonum punctatum</i>	dotted smartweed	herb	OBL	3
<i>Polygonum scandens</i>	climbing buckwheat	herb	FAC	2
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Rudbeckia laciniata</i>	cutleaf coneflower	herb	FACW+	3
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2
+ <i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix amygdaloides</i>	peach-leaved willow	shrub	FACW	4
+ <i>Salix exigua</i>	sandbar willow	shrub, herb	OBL	1
<i>Salix nigra</i>	black willow	shrub, herb	OBL	3
<i>Scutellaria lateriflora</i>	mad-dog skullcap	herb	OBL	4
+ <i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
+ <i>Setaria glauca</i>	pigeon grass	herb	FAC	*
+ <i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
+ <i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Sorghastrum nutans</i>	Indian grass	herb	FACU+	4
<i>Stachys tenuifolia</i>	slenderleaf betony	herb	OBL	5
+ <i>Torilis japonica</i>	hedge parsley	herb	UPL	*
++ <i>Toxicodendron radicans</i>	poison ivy	herb	FAC+	1
+ <i>Tridens flavus</i>	common purple top	herb	UPL	1

Species list continued on next page.

ROUTINE ONSITE WETLAND DETERMINATION

Area 2 (page 5 of 6)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003
Project Name: FA 662 (IL 4) **Section No.:** 1-ILS
State: Illinois **County:** Sangamon **Applicant:** IDOT District 6
Area Name: Berm
Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.
Location: This berm begins approximately 40 m (131 ft) south of where IL 4 crosses Spring Creek.

SPECIES LIST (Cont.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Ulmus</i> sp.	elm	herb	----	--
+ <i>Verbena urticifolia</i>	white vervain	herb	FAC+	3
<i>Vernonia missurica</i>	Missouri ironweed	herb	FAC+	5
++ <i>Viola pratincola</i>	common blue violet	herb	FAC	1
<i>Vitis cinerea</i>	winter grape	vine	FACW-	4
<i>Vitis riparia</i>	riverbank grape	vine	FACW-	2
+ <i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

*non-native species

$$FQI = \sum C/N = 132/\sqrt{61} = 16.9$$

$$\bar{C} = \sum C/N = 132/61 = 2.2$$

+weedy, annual, or non-native species

++early successional but typical of native wetlands

Planted Species

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Betula nigra</i>	river birch	shrub	FACW	4
<i>Carya illinoensis</i>	pecan	shrub	FACW	6
<i>Cephalanthus occidentalis</i>	buttonbush	shrub, herb	OBL	4
<i>Cornus stolonifera</i>	red osier dogwood	shrub, herb	FACW	4
<i>Fraxinus pennsylvanica</i>	green ash	shrub	FACW	2
<i>Platanus occidentalis</i>	sycamore	shrub	FACW	3
<i>Quercus bicolor</i>	swamp white oak	shrub	FACW+	7
<i>Quercus palustris</i>	pin oak	shrub	FACW	4
<i>Taxodium distichum</i>	bald cypress	herb	OBL	*

$$*FQI = \sum C/N = 166/\sqrt{69} = 20.0$$

$$*\bar{C} = \sum C/N = 166/69 = 2.4$$

*These calculations include the complete species list above, as well as the planted species.

ROUTINE ONSITE WETLAND DETERMINATION

Area 2 (page 6 of 6)

Field Investigators: Wiesbrook, Matthews, Wilm, and Larimore **Date:** Sept. 17, 2003

Project Name: FA 662 (IL 4)

Section No.: 1-ILS

State: Illinois

County: Sangamon

Applicant: IDOT District 6

Area Name: Berm

Legal Description: NW/4, SW/4, Sec. 15, T. 16 N., R. 5 W.

Location: This berm begins approximately 40 m (131 ft) south of where IL 4 crosses Spring Creek.

Determined by: Brian Wilm, Jeff Matthews, and Rick Larimore (vegetation and hydrology)
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Appendix B

Photographs of Wetland Mitigation Sites



Picture 1A. Facing northeast from photostation 1.



Picture 1B. Facing east from photostation 1.



Picture 1C. Facing southeast from photostation 1.



Picture 2A. Facing south from photostation 2.



Picture 2B. Facing west from photostation 2.



Picture 3A. Facing north from photostation 3.



Picture 3B. Facing northwest from photostation 3.



Picture 3C. Facing west from photostation 3.